時田 郇*: 海藻知見 (6)

Jun TOKIDA* : Notes on some new or little known Marine Algae (6)

11. **Halosaccion ramentaceum** (L.) J. Agardh, Sp. Alg., 2 (2): 358 (1852)-Kjellman, Alg. Arctic Sea; 153 (1883)-Taylor, Mar. Alg. N.-E. Coast N. Amer., 304 (1937) - Tokida & Ohmi, List of the marine algae of Tōbuti Lake, Saghalien, in Bot. & Zool., 9 (11): 432, (1941).

Fucus ramentaceus Linnaeus, Syst. Nat., ed. 12, 2: 718 (1765) - *Ulva sobolifera* Oeder, in Fl. Dan., 7: 356 (1767) - *Halosaccion soboliferum* Ruprecht, Tange Ochot. Meer., 268 (1851). - non *Fucus soboliferus* Fl. Dan., pl. 1065 (1792) (=*Rhodymenia palmata* var. *sobolifera* J. Agardh - *Fucus tubulosus* Lepechin, in Nov. Comm. Acad. Petrop., 19: 476 (1771) -*Halosaccion tubulosum* Ruprecht, *loc. cit.*, 272 et 292 (1851).

Japanese name. *Hoso-benifukuronori* (Tokida).

This species is known as a multiform species (*cf.* Kjellman, 1883, p. 154, Jonsson, 1901,1) 138, Taylor, 1937, b. 305), and nearly half a dozen forms (varieties, forms and subforms) have been described by previous investigators. The Saghalien specimens in the writer's hand are referable to the following four forms and one subform. The width of the frond mentioned in the following key to the forms is measured in a dried state.

So far as the writer knows, no one has ever described forma *typica* for the present species. The typical form of the species seems to be represented by the forma *subsimplex* (Rupr.) Kjellm., which is no doubt the basic form of other proliferous forms such as f. *robustum* and f. *densum*. According to Börgesen (1902, p. 367),2) "f. *subsimplex* appears to be the most common" in the Faeröe Islands. On the other hand, Kjellman (1883, pp. 154-155) described his f. *densa* as "the most known form", which he referred to *Fucus ramentaceus* illustrated by Turner (Hist. Fuc., 3, pl. 149). In southern Saghalien, f. *densum* is fairly common, while f. *subsimplex* is unknown yet. A young shoot of f. *Tilesii*, which is sparsely found among the adult fronds growing gregariously on pebbles, resembles f. *subsimplex* in general aspect.

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1) Jonsson, H. The marine algae of Iceland. I. Rhodophyceae.Bot. Tidsskr, 24 (2), 127-155, figs. 1-4. 1901.

2) Borgesen. F, The marine algae of Faeroes, in Warming, Botany of the Faeroes, Part 2: 330-532. Copenhagen. 1902.

Key to the forms

I. Frond narrow, up to 4 or 8 mm. broad, always much proliferated.
  A. Proliferations 0.5–4 mm. broad, simple or scarcely branched.
    1. Proliferations membranous……………………………………*a.* f. *robustum.*
    2. Proliferations cartilaginous…………………………………*b.* f. *densum.*
  B. Proliferations 5–8 mm. broad, membranous, more or less repeatedly subflabellato-di-polychotomous…………………………*c.* f. *ramosum.*
II. Frond broad, up to 10 (–15) mm. broad, cartilaginous, often subflabellato-di-polychotomously branched.
  A. Frond not proliferated……………………………………………*d.* f. *Tilesii.*
  B. Frond much proliferated……………………*da.* f. *Tilesii* subf. *proliferum.*

a. **Halosaccion ramentaceum** f. **robustum** Kjellman. Alg. Arctic Sea, 153, pl. 12, fig. 4, pl. 13, figs. 1 & 2, 1883. - Nagai, Mar. Alg. Kurile Isls., 2:204, 1941.

Habitat. Growing on rocks in the littoral and upper sublittoral belts, and often cast ashore. Collected in various localities in southern Saghalien.

Distribution. *Sp.* - Hokkaido, Kuriles and Saghalien; Ochotsk Sea; Kamtschatka; Alaska; North Atlantic Ocean (Iceland, Faeröes, Norway); Arctic Ocean. Forma *robustum* - Hokkaido, Kuriles and Saghalien; North Atlantic Ocean; Arctic Ocean.

Main axis narrow linear, tubular, more or less cartilaginous, simple or branched, much proliferated on the margin; proliferations narrow linear, membranaceous, tubular while fresh but complanated in drying, up to 18 cm. long, 0.5-4 mm. proad, simple or once to twice dichotomously divided.

The specimens referred to the present form differ from those identified to the next merely in having membranaceous proliferations instead of cartilaginous ones (*cf.* Kjellman, 1883, p. 155). A specimen from Abashiri, Hokkaido, collected by Watanabe in 1892 and deposited in the Herbarium of our Faculty of Agriculture, is also referable to f. *robustum.*

b. **Halosaccion ramentaceum** f. **densum** Kjellman, Alg. Arctic Sea. 154, 1883.

Fucus ramentaceus Turner, Hist. Fuc., 3 pl. 149, 1811.

Habitat. Growing on rocks in the littoral and sublittoral belts, often cast ashore. Collected in various localities in southern Saghalien.

Distribution. Saghalien ; Iceland ; Arctic Ocean.

Main axis similar to that of f. *robustum*; proliferations narrow linear, cartilaginous, tubular while fresh, more or less compressed but not so flat in drying, up to 15 cm. long, 0.5-4 mm. broad, simple or once to twice dichotomously divided.

Kjellman says (1883, p. 155) : "It may be stated in general that f. *densa* is more cartilaginous than the others." He referred his f. *densa* to *Fucus ramentaceus* L. illustrated by Turner (*loc. cit.*), who described the substance of his plant as being "membranaceous, thin". The writer follows Kjellman in identifying his specimens to the present form.

c. Halosaccion ramentaceum f. ramosum Kjellman, Alg. Arctic Sea, 154, pl. 13. fig. 4, 1883.

Fucus tubulosus Lepechin, in Nov. Comm. Acad. Petrop., 19.: 476, 1775.

Habitat. Growing on rocks in the sublittoral belt. Ootomari (Tokida, 1929), Merei (Miyabe, 1906) and Tōbuchi-ko (Tokida, 1935. 1941) in Aniwa Bay Saghalien.

Distribution. Hokkaido and Saghalien; Atlantic coast of North America; North Atlantic Ocean (Iceland and Faeröes); Arctic Ocean.

Main axis similar to that of f. *robustum*; proliferations narrow to broad linear, membranaceous, tubular while fresh but complanated in drying, up to 14 cm. long to 5-8 mm. broad, often broadened upward, more or less repeatedly subflabellato-di-polychotomously divided, usually subulato-attenuate at branch tips. (Fig. 31).

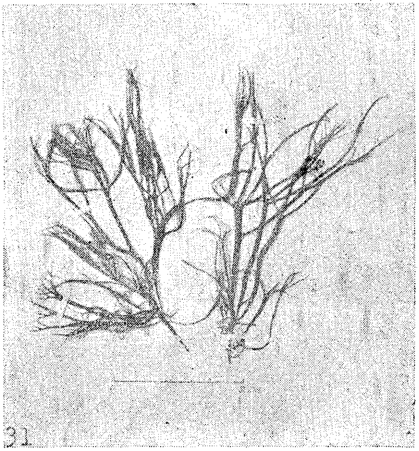


Fig. 31. *Halosaccion ramentaceum* f. *ramosum* Kjellm. From a photograph of two branches of a plant from Tobuchi-ko.

The specimens which the writer refers to the present form are characterized to have membranaceous, lmore or less repeatedly subflabellato-di-polychotomously branched proliferations. They were all collected in Aniwa Bay at more or less sheltered localities. A specimen from Abashiri, on the Ochotsk Sea coast of Hokkaido, collected by Watanabe in 1892 and deposited in the Herbarium of our Faculty of Agriculture, is also referable to this form.

d. **Halosaccion ramentaceum f. Tilesii** (Kjellm.) Tokida, comb nov.

Halosaccion Tilesii Kjellman. Om Beringhaiv., Algfl., pl,1, 29, figs. 16-19, 1889 (f. *nuda*) - Setchell & Gardner, Alg. N.-W. Amer., 319, 1903. - Saunders, Harrim. Alaska Exped., Alg., 436, 1901.

Habitat. Growing on rocks in the littoral and upper sublittoral belts, and often found cast ashore. Kushunnai (Miyabe, 1906), Nishinotoro (Tokida, 1926), Chishiya (Tokida. 1935), Ootomari (Izumiyama, 1906), and Yaman (Matsubara, 1933) in southern Saghalien.

Frond gregarious, narrow linear and long stalk-like below, gradually broadened upward into a linear to narrow cuneate blade, compressed, more or less fistulose, simple or more often di-poly-chotomo-subflabellately divided into narrow attenuating segments, with no proliferation on the margin; cartilaginous in substance; the total length up to 22 cm., breadth up to 10 mm. (rarely to 15 mm. or more) below the forking. (Figs. 32-33).

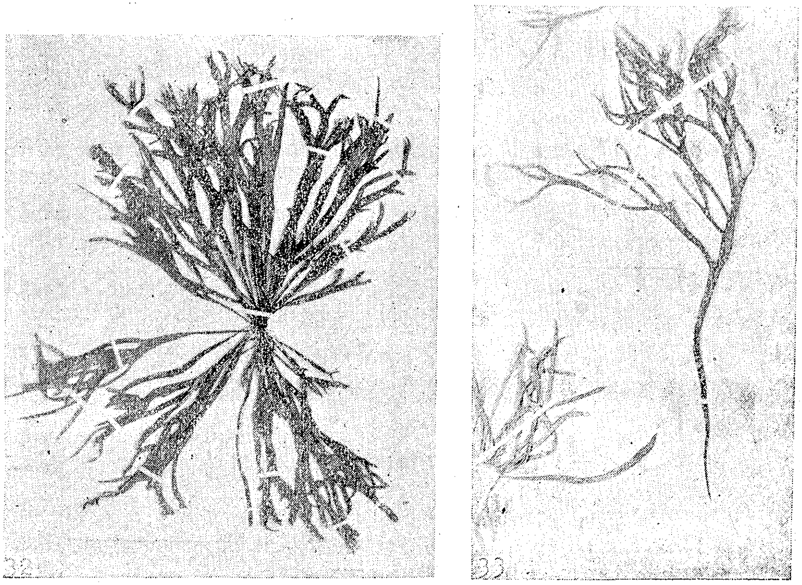


Fig. 32-33. *Halosaccion ramentaceum* f. *Tilesii* (Kjellm.) Tokida. 32. Plant from Chishiya. 33. A branch of a plant from Ootomari.

da. Halosaccion ramentaceum f. **Tilesii** subf. **proliferum** (Kjellm.) Tokida, comb. nov.

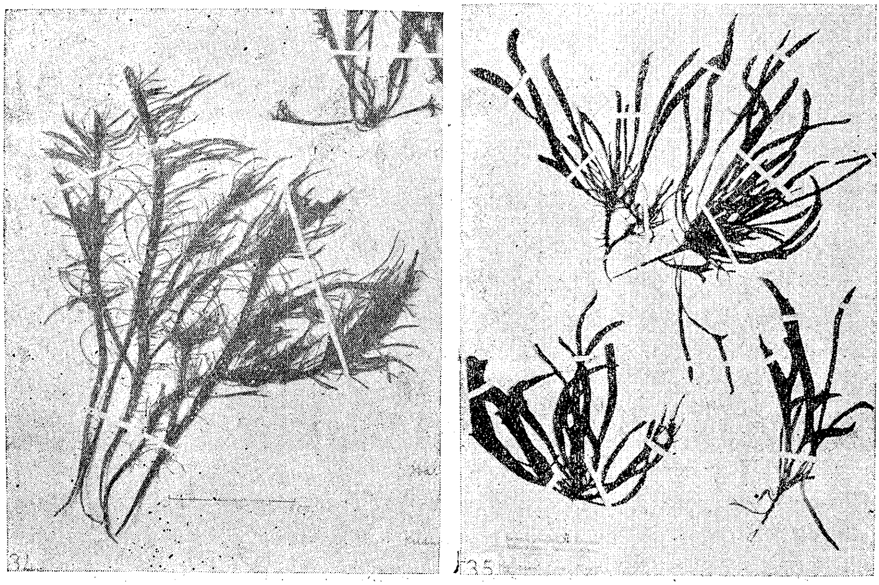
Halosaccion Tilesii f. *prolifera* Kjellman, Om Beringhafv. Algfl., 29, pl. 1, fig. 20, 1889.

Haditat. Growing on rocks in the littoral and upper sublittoral belts, and often found cast ashore. Pilevo (Miyabe, 1906). Kushunnai (Miyabe, 1906), Tomarioru (Miyabe, 1906), Hishitoma (Tokida, 1906). Shiranushi (Tokida, 1932), Nishinotoro (Miyabe, 1906; Morimoto, 1925), Chishiya (Tokida, 1935), Kochōbetsu (Matsubara, 1933), Sakaehama (Tokida, 1929), Waare (Miyabe, 1906), and Jimtaki (Miyabe, 1906), in Saghalien.

Distribution. Hokkaido and Saghalien; Bering Island.

Frond abundantly proliferous from the margin; proliferations cartilaginous, more or less compressed, linear or narrow cuneate, usually simple but sometimes slightly di-polychotomous, often somewhat incurved, up to 20 cm. long, 3–10 (–15) mm. broad. (Figs. 34–35).

Our specimens which are referred to forma *Tilesii* agree very well with



Figs. 34-35. *Halosaccion ramentaceum* f. *Tilesii* subf. *proliferum* (Kjellm.) Tokida. 34. A group of plants from Kushunnai. 35. Plant from Hishitoma. × 113.

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3) Agardh, C. A. 1820. Species algarum, 1 (1). Lund.

the figures of *Halosaccion Tilesii* Kjellm. in the Tabl. I of Kjellman's Om Beringhafvets Algflora. *H. Tilesii* was founded on *Fucus tubulosus* Tilesius. The description of the latter given by Agardh (1820, p. 219), however, is said dy Ruprecht (1851, p. 279) to correspond with *Halosaccion microsporum* Rupr. Accoding to Ruprecht, Tilesius' specimens distributed under the name *Fucus tubulosus* are heterogeneous and many of them are nothing but *Halymenia palmata β. prolifera* (=*Rhodymenia palmata* f. *prolifera*), while two of the rest coincide with *Halosaccion microsporum* and one with the typical form of *Halosaccion soboliferum* Rupr. (=*H. ramentaceum*). It is not certainly known whether Kjellman laid the basis of his identification upon a certain form existed among Tilesius' specimens. As far as it remains non-proliferous (f. *nuda* Kjellm.), the present plant appears to be hardly referable to a form of *H. ramentaceum*. But there exist older individuals which are beset with few to many proliferations (f. *proliferum* (Kjellm.) Tokida) approaching to f. *robustum* or f. *densum* of *H. ramentaceum*. Some of those proliferous individuals resemble closely f. *densum* except in the character of the main axis which still retains some characteristics of f. *Tilesii*. The proliferations are in general broader than those of f. *robustum* and f. *densum*, and sometimes assume a peculiar shape resembling a sword, being more or less broadened and somewhat incurved in the upper portion. Such sword-shaped proliferations remind us of the var. *gladiatum* Eaton reported from the Atlantic coast of North America (cf Farlow, 1881, p. 143 and Taylor, 1937, p. 305).

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11. **ホソベニフクロノリ** (時田命名) は體形の變化に富む種類で, 從來幾つかの變・品種が報告されているが, 樺太採集の標本に4品種と1亜品種を區別することが出來た。これらは體の幅の狹いものと廣いものとに分けられ, 狹いものの內, 幅が4mm以下で單條又は僅かに分岐し, 多數の副枝を生じて, 副枝が膜質のものは f. *robustum*, 革質のものは f. *densum*; 幅が8mm以下で, 稍扇形に2叉狀又は多叉狀に分岐し, 副枝が膜質であるものは f. *ramosum*; 體の幅が廣く 10-15mm に達するものは革質で, 屢々稍扇形に2〜多叉狀分岐をなし, 副枝を缺くものは f. *Tilesii*, で, 副枝を澤山有するものは f. *Tilesii* subf. *proliferum* である。この內 f. *Tilesii* は從來別種とされていたものであるが, 今本種に合併することを提案する。本種は樺太各地の沿岸にかなり澤山打ち揚げられる海藻のひとつで, 何か利用の途が開ければ資源として有望であると思われた。

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[4] Farlow. W. G. 1881. Marine algae of New England and adjacent coast. Report of the U. S. Fish comm. for 1879. Washington.